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Multicultural in Indonesia's Biofuel Innovation Initiative: Critical Issues of Land Use and Sustainable Environment

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Abstract

The Presidential decree was triggered national-scale energy plant cultivation to all districts. It is based on the assumption that Indonesia's energy security problem need to be addressed that accommodate poverty and environment problems. Until today, the main objective of the program has not materialized, social conflicts have been emerging mostly triggered by land use and environment issues. While energy-economic calculation is central in the biofuel program conception, the evidences reveal a wide range of cultural issues taking a significant position in the program adoption at rural communities. In other words, multicultural is a critical issue in the biofuel program adoption.

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Keywords :Biofuel innovation; land use; sustainable environmen; multiculturality; collective learning.

1. Introduction

In January 2006, Susilo Bambang Yudhoyono, the first democratically elected president of the Republic of Indonesia, launched a presidential instruction that call on “The Provision and Use of Biofuel as Alternative Energy Source”. Eight months beforehand, the government cut energy subsidy at a significant level that had triggered widespread public protests. Via various public media president Yudhoyono convinced the public that biofuel is a promising solution to the pressing energy security and poverty problems faced by the nation. The presidential instruction turned out to mark the beginning of a

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national scale energy crops plantation and biofuel researches. The entire government ministries, most of governors and district heads, leading companies, NGOs and researchers from major universities responded to the instruction, some of them with high enthusiasm. However, another problem has arisen not long after the instruction was actualized.

The Forestry Ministry was under pressure to issue permits on the use of non-productive lands for energy crops plantations a cross the state's territory. The nation-wide biofuel rush also stimulated land use conversion from the conventional food crops plantations to energy crops plantations (Nurlaila, 2007). If not planned carefully, land conversions may lead to unpredictable environmental change either at regional or global level (Scho¨ßer et al, 2010; Dale, O'Neill, Pedlowski, and Southworth 1993; McDonnell and Pickett 1993; Meyer and Turner 1994). At the local scale, abrupt land use conversions may cause unprecedented biodiversity losses and soil degradation. Excessive conversion from food plantation to energy plantation may induce food security issue.

Land use expansion to support massive biofuel production may also induce significant deforestation. For example, Brazil, who started massive biofuel production in 1990, lost 8.14% of its forest in fifteen years (520,027,000 hectares in 1990 to 477,698,000 hectares in 2005). From 2000 to 2005, Brazil lost 3.466 million hectares of its forest annually. Indonesia may face a similar risk due to the growing demand for crude palm oil (CPO) based biofuel. Large-scale palm trees plantations have begun in forest areas in major islands such as Kalimantan, Sulawesi and Papua. The government estimates that 500,000 ha of land conversion per year is required for palm estates. The East Kalimantan government plans to carry out 1 million hectares land conversion for oil palm plantation to be completed in 15 years. Other provincial governments also made similar plans.

The practices of forest clearing are indeed prohibited under the Indonesia's environment regulation. The state minister for the environment has reminded that the government would not allow the clearing of natural forest for palm plantations, and demanded that such projects should make use of idle lands. The type of land may be used for jathropa curcas plantation. The National Team for Biofuel Development estimates that around 12 million hectares (Table 1) of land is available for palm trees plantation. However, the estimation seems to miss a cultural factor, that is the cultural meaning of lands held by local communities and farmers. This factor apparently plays an important role in determining that a specific use of lands is culturally acceptable or not.

Table 1 distribution of available lands. Source: National Team for Biofuel Development Program

Provinces	Hectarage (ha)
South East Sulawesi	212,123
North Sulawesi	34,812
Nusa Tenggara Timur	101,830
Maluku	2,304,932
Papua	9,262,130
West Kalimantan	514,350
Central Sulawesi	251,856
South Kalimantan	65,638
Total	12,947,671

2. Methodology

In this research was choosed Actor-Network Theory (ANT) that is conducted by following bio energy actors from several entry points consist of culture's value, farmer, pickers, and artefact. Relation among

actors is observed by following the actors. In human actors, actor to be observed is conducted by rolling a snow ball' (*Term devised by Bijker 1997*)—an actor mention or suggest another actor to be interviewed, while in non-human actor, are conducted by following a culture's value, following farmer, following pickers, energy institutions, and artefact, etc. In practice, distinction between human and non-human is vanished through 'center of calculation' (*Term devised by Bruno Latour (1987). In general, as proposed by Callon & Muniesa (2003), 'center of calculation' can be divided into three steps*)mixed both of them.

3. The biofuel in the actor's perceptions

Several factors in specific contexts may influence decision on land-use. Lambin et al. (2003) classifies the factors influencing land-use decision making into proximate and underlying causes. The proximate causes constitute social activities and actions at the local level, while the underlying causes originate from non-local actors such as provincial governments, investors or other global actors.

To the national government, the biofuel program is an energy program and is administered under the energy ministry, though its realization involves massive agricultural activities. Meanwhile, the traditional practices known to farmers are food agriculture. Most farmers do not have experience in energy producing activities. The representative of local farmers describes its perception as follows:

Everybody knows that biofuel program is a poverty alleviation program, especially for farmers. It does in the hope that similar to Pertamina, the State Oil Company; but we can't imagine oil producing. .We are society, accordingly we follow government roles

Land is an essential factor of production so economically every institution such as Enhil, Waterland want to have control over (Ricahard, 1992). Moreover, energy agriculture needs massive land to supply biofuel demand on local and global market. The main reason Waterland, Netherland's NGO made an agreement with Perhutani KPH Purwodadi is to have land expansion. The Waterland's regional director says that :

"....KPH Purwodadi has the largest area in Central of Java and the second is KPH Cilacap, hence we want to make an agreement with them, especially KPH Purwodadi, but we ended relationship with KPH Cilacap ..." .

In addition, the prices of carbon trading are very expensive; stimulate to increase contribution on biofuel program. It indicates that the economic factor is the main reason to drive actions. Studying on local community interact with land use directly. Underlying causes can be interpreted as 'individual and social responses to changing powerless conditions, which are mediated by institutional factors' and are 'formed by a complex of social, political, economic, demographic, technological, and cultural variables' (Lambin et al. 2003). However, at the first generation the biofuel program used power to mobilize resources; land use has significant definition on economic perspective. *Pesanggem,* farmer's who has labor position at Perhutani, say that:

"...This (land) is not mine, we only use the land belong to Perhutani……so, we can't choose anything...." . The other statement is:

"...Pak Adm, Local leader of KPH Perhutani, agreed with Waterland,……..so, we are just follower ".

Leopold's land ethic said the land has itself paradigm. It is not just an instrumental, useful, utilitarian and has efficient value to humans—valuable in its own right. However, that has a different opinion, "the land itself" deserves human moral consideration (or, moral consider ability). While, political power institution has the right of making laws for regulating and preserving of property, and of employing the force of the community in the execution of such laws, and in the defences of the commonwealth from foreign injury; however all this only for the private.

4. Multicultural issues

Supporting *Nyamplung* commodity in bio fuel program is not the single entity, for the reason that stimulates issues such as pick up of live, social trust, traditional knowledge, land use, etc. John Locke explains that as long as everyone uses as much land as they can benefit from, there is no scarcity of land in the world; however, it is contrary to the first generation bio fuel program. While energy-economic calculation is central to the government driven bio fuel program conception, the evidences reveal a wide range of cultural issues taking a significant position in the program adoption at rural communities. Different rural communities have a different perception on land use and environment, according to their traditional cultures. In other words, multicultural is a critical issue in the bio fuel program adoption. Moreover, the alternative model of bio fuel is based on local knowledge in Indonesia, because it is heterogeneous country with complex culture values as the result of heterogeneous and specific land use issue. This case illustrates that energy plantation is based on collective learning at the community levels, while the government redefines its role as learning facilitator.

Social change is the transformation of culture and social institutions over time (Karim, 2010); however, it will be more shortly if we do something such as interconnecting with social value, capacity building of local partner and others. All farmers, pick up, bring with them skills and experiences that influence the way they perceive the *Nyamplung* supply, and economic activities particularly. They necessarily bring a philosophy to culture value which is the basis of their practice. Local agent says that :

...The earth and all its resources ere given by God to man in common? So, we must share…. And his other statement is:

"…The land and its plants and animals originally belonged to everyone…Kampret. Is our hero….."(Kampret is cave bat that is contributed for Nyamplung plantation in Purworejo and Kebumen. It is local value from their ancestor).

Furthermore, the traditional paradigm is the cultivating land, *Nyamplung* plantation of land is the public good, so everybody can pick it up. In addition, they have the *gotong royong* (family gathering perception) because they think that nothing made by God for man was to spoil or destroy. Leopold explains that is a new ethic that gives land a moral value. It is relevant with value of *sedekah bumi* celebration (*The ethical relation to land can exist without love, respect, and admiration for land, and a high regard for its value. By value, of course, I mean something broader than mere economic value; I mean value in the philosophical sense)*. The farmer who is a respondent in Kebumen said that:

...Nobody would think himself with to eat of another man? God and His reason commanded him to subdue the earth…improve it for the benefit of our life…so, we should respect for the land.

Wahyudi's community, the representation of PT.Energy Green Resources, has established several mutually supporting networks: the cooperative which buys the seeds from villagers for extraction at the workshop in Grobogan. It expanded to the Central of Java area to support the security of Nyamplung supply such as Kebumen, Purworejo, and Cilacap. Nyamplung supply program has a special function; furthermore, the Local non-profit organization is a potential partner to accelerate social change for dissemination of bio fuel spirit because it has a knowledge of local community. Bio fuel program is new and the biggest program because of interconnecting actors. Furthermore, it need a local agent to facilitate social change process. Wahyudi's community, local community who is the facilitator on bio fuel program based on Nyamplung commodity, has culture knowledge how to communicate with Nyamplung pick up. Therefore, they have the function as an agent for social change as a result of social learning process. Eto et al argues that the organizational form, structure, and mission must be very compatible with the social change goals for energy efficiency (2010). The director of PT.Energy Green Resources said that:

we speak with their language..it is needed for an acceptance....We have a nice dream that they move on to poverty alleviation.. they must know their value.

4.1. Box 1 Patron - Client

In 2007, the PT.Energi Hijau Lestari (Enhil) the local company who contribute to support bio fuel program was established. It located in Tawang Harjo, Ngaringan, Grobogan, and Central of Java. It was the important actor because it could invite Susilo Bambang Yudhoyono to introduce the bio fuel program to the lowest level, the society who interaction directly on small land. This event was a moment to mobilize the land owner directly and indirectly to converse land from conventional agriculture to the energy agriculture. It triggered land conversion successfully because it was needed to support Enhil's refinery activities. It used not only government land but also private land. So Enhil's refinery activities became the biofuel's icon.

However, it is not explained the general terms like unproductive or productive pieces of land. In general terms, land for biofuel is defined as unproductive pieces of land, which are not appropriate for production of economically high-value commodities, critical land, and uncultivated land. It may also means temporarily uncultivated piece of land, geographical distribution of which explanation. Another category is '*tegal/ kebun/ ladang/ huma',* which has lower economic value than paddy field or plantation. This condition caused by information asymmetry.

In 2010, Waterland Asia Bio Ventures (WABV) is a multinational company into which around 32 Dutch companies invest their capital. WABV was not part of Enhil-Peduli-farmer groups' linkages. About 5 months after President Yudhoyono came to Ngaringan sub-district, WABV approached the Grobogan's local government and communities, and managed to arrive at a Memorandum of Understanding (MoU) on long term Jatropha Curcas development. Three parties joined in the MoU, namely WABV as investor, forestry agency of Purwodadi (the capital of Grobogan) as the owner of land and regulator of land use, farmer communities (pesanggem) grouped into Organization of Forest Village Communities as cultivators.

Pesanggem and Perhutani have a patron-client relationship as a result of weakness (Todaro, 1998). Plantations on Perhutani's land usually invoke land conflict, especially when three years period is over. Though exact data are difficult to obtain, there are indications that land conflict is prevalent. The newest potential conflict occurred when they should plant Jatropa curcas due to Perhutani-Waterland agreement.

Manciones (1999) posits that social change is inevitable (Karim, 2010); however, it has different acceleration. Some societies change faster than hunting and gathering societies change quite slowly. Kebumen and Cilacap society is faster than Purworejo society, in spite with the same stimulations. Furthermore, material culture changes faster than non-material culture such as ideas and attitudes. The land use issue on bio fuel development has a different perspective when collective responsibility of renewable energy. The other ecosystems define the part of local culture, it is something common. The facilitator said that:

"We are more successful in Kebumen and Cilacap than Purworejo because they have the religious and traditional values and in the end, we speak with their language because of our success."

4.2. Box 2. The integrity of learning process

In 2005, president declared a program of biofuel to the public as a solution for poverty alleviation through the "Desa Mandiri Energi" (DME – energy self-sufficient village). Wahyudi was one of the participants and he took this opportunity to plant the Jatropha curcas. Then it became the recommended plant for biofuel supply. However, his efforts in jatropha bio fuel experiment and engaging the local community to cultivate the plant ended in failure; he abandoned the project in 2005.

He conducted research to evaluate his failure and he found that sense of belonging to the weak bio fuel program. It indicated on their *patron-client* like relationship model. In addition, they had to mobilize the

large productive land of farmers. He has an opinion that land was the important resource for the farmers and their dependency was high. Moreover, the Jatropha curcas is a remote commodity; it was initiated by Japan to support their war program, so for farmers it was a high risk to bio fuel supply. The same with Grobogan case, land was a production factor that has highly economic values. Therefore, he was conducted research by observing local commodity to be the icon of bio fuel product and that was Nyamplung (*Callophyllum inophyllum*). The output of his evaluation was that he had to make a new business design models in order to maintain the sustainability of this program.

To increase the sense of belonging of the community, he conducted research on social aspect, social mapping of his local partner to choose Nyamplung and made closed relationship. He found an 'absurd' relationship of traditional knowledge and values, in engaging their cooperation. Local community was Wahyudi's partner that got Nyamplung from Cilacap, Kebumen and Purworejo whose society lived with different culture. Cilacap and Kebumen societies are more religious than Purworejo society then they need a different approach; however, they have the same traditional culture, Javanese values based on their ancestor values. For example, land is a part of their life opinion, the '*gotong royong'* (community cleaning and helping), Sedekah Bumi (respecting on land celebration), the harvest is not only private possession but also public and all of them has indirect community agreement. Traditional values made a different understanding on land use perspective as sense of belonging to the harvest of Nyamplung, to land for Nyamplung plantation was weak; however, they had the highest spirit for bio fuel program continuity. The land of growing of Nyamplung, were not only economic value but also culture value, because they were part of ecosystem and they were part of actors on bio fuel system.

5. Behavior of change for sustainability

Nyamplung is not only energy and economic issues but also integrated into sustainable environment issues, in this way is meaningful to the communities' cultures. Sustainability of biofuel program base on Nyamplung commodity is suspended on participatory of local community for Nyamplung supply. The collective dynamics of technology ''soft technology' introduce further complexity to the structure–behavior–performance paradigm. The importance of the phenomenon (structure–behavior–performance) of social learning is a basic feature of the dynamics of sociotechnical development emerges from this insight (Sørensen, 1995). Biofuel program is not single entity; much of that experience created is unsustainable because, beneath it all, the developmental perspective turned what had always been 'multi-sect oral' into 'uni-sectoral' (Martinez, 2005). Most of them has a problem on supply as agriculture has more complexity than on factory. In the other hand, it engage multi actors and aspect and for example, farmer, land, climate, etc. Socio culture of intellectual property has adopted on tremendous significance for biofuel sustainability and to be a motor for social movement. In this study, sustainable development is represented by the ability of the biofuel actors to supply raw material to the biofuel factory. The security of raw material for biofuel commodity need actor's consensus because it will mobilize some resources. On this case, land is not crucial aspect, but security of supply depend on social agreement, consensus decision-making of Nyamplung pickers. Consensus decision-making of Nyamplung pickers because it is a need to seek not only the agreement of most participants but also the resolution of social rules on Nyamplung pickers community on Kebumen, Purworejo and Cilacap. Nyamplung will have economic value when biofuel program successfully, so in this study includes reflexive awareness of the bioenergy actors to anticipate the conflicts.

The difference between the culture of humans and the behaviors exhibited by others is that humans cannot survive without culture. Everything they see, touch, interact with and think about is cultural. Culture change is not easy; and over the years we have all seen many culture changes fail to deliver the promised benefits, often despite massive investment. However, any change, from introducing new

systems to transforming the entire strategic direction, depends on people behaving in new ways from day to day. Interaction between actors and learning process to support sustainable development is indicated by openness, flow of information, negotiation, and a good decision making (Rip and Kemp, 1997). Nyamplung pickers' consensus is social governance to consistent management, cohesive policies on Nyamplung pickers' agreement. Reflexive awareness covers openness and transparency processes. Key factors with respect to openness are the production and handling of information, access to negotiation and decision making arenas, and communication structures (Jelsma,1995).

In addition, the Nyamplung pickers say that:

"We believe to them, PT.Energy Green Resources, they do a greatdeal for us...they teach me how to see an oportunity..we have many benefit especially economic improvement. For example, we can built our new home, we have livestock and the others."

Building up trust across the society, it used as a barometer for how the change process is being received, flagging up issues to be addressed and advising on the best way to communicate the change process. They interact with local community intensively; furthermore it is the way for solving problems in intercultural communication. The director of PT.Energy Green Resources says that:

"For us today .they have a discussion tradition to make decision,... we used it to deliver our program for susainability...lokal knowledge, ancetor's value, is heart of community...so, we will touch it….like the title of song. 'Touch on their heart, so it will be your own'."

6. Conclusion

The findings of the study have shown that Indonesia is heterogeneous country and has specific "meaning" on land use issue of bio fuel program. Meaning is a representation of complexity. Meaning is not image or model of complexity used by a conscious or social system, but simply a new and powerful form coping with complexity under the unavoidable condition of enforced selectivity (Noe, 2003). This definition conforms to two critical models of a commons perspective/approach. Firstly, land use is production factor therefore interaction of pesanggem and powerful institution such as Waterland, Perhutani, and Enhil is an economic factor although they have local value. Since land has an economic perspective, it will make patron-client model so that the interaction is weak. In addition, it is not the potential resource to support bio fuel development program. Secondly, the other perspective, land use is a part of culture, has the power to mobilize resources. The evidences reveal a wide range of cultural issues taking a significant position in the program adoption at rural communities. Secondly, Secondly, energy and economic issues are integrated into sustainable environment issues in a way that is meaningful to the communities' cultures. Nyamplung is a part of the farmer's life, furthermore, become embedded and internalized within the farmers, making it an acceptable agriculture crop. The selection of energy plant is based on collective learning at the community levels, moreover, through this 'nyamplung' initiative will be hope to provide employment and improve the local economy of the poor in the village that is environmentally sustainable, and it will answer the question the land use issues on bio fuel development.

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References

Barnes, Douglas F., Khandker, Shahidur R., Samad, Hussain A, *"Energy Access, Efficiency, and Poverty: How Many Households Are Energy Poor in Bangladesh?"*

Borowiak, Craig, 2007, *"Farmers' Rights: Intellectual Property Regimes and the Struggle over Seeds"*

Byrne, John., Martinez, Cecilia,. Ruggero, Colin, *"Relocating Energy in the Social Commons Ideas for a Sustainable Energy Utility"*

Karim, Hafazah Abdul., Hashim, Amalina Haslyssa, "*The Effect of a Resettlement Scheme on the Social- Cultural Changes of the Temuan Community"*

Noe, Egon dan Alroe, Hugo. (2003), "*Combining Luhmann and actor network Theory to See Farm Enterprises as self-Orginizing System."*

Ravallion, Martin. 2007. *"Evaluating Anti-Poverty Programs,"* Handbook of Development Economics, Vol. 4 pp. 3787-3846.

Rhett A. Butler,(2005), "Amazon deforestration slows in Brazil"

Scho¨ßera, B. Helminga, K. and Wiggeringa, H.(2010), "*Assessing land use change impacts – a comparison of the SENSOR land use function approach with other frameworks "*

Soekartawi,1996, "*The agriculture development for poverty alleviation*" University Indonesia Press.

Sawit Watch, Palm oil for biofuels increases social conflicts and undermines land reform in Indonesia, 26 Januari 2007; *" Seperti Hantu di Tanah Sendiri*", Kompas 16/6/2007.

Quétier; Fabien,at all , "*Assessing ecological and social uncertainty in the evaluation of land-use impacts on ecosystem services"*

The Business Watch Indonesia, 2007, "*Biofuel Industry In Indonesia: Some Critical Issues*"

Tiwaria, Rakesh,. At all, *"Land use dynamics in select village ecosystems of southern India: drivers and implications"*

Verburg, P.H., Van de Steeg, J., Veldkamp, A., andWillemen, L. (2009), *''From Land Cover Change to Land Function Dynamics: A Major Challenge to Improve Land Characterization,''* Journal of Environmental Management, 90, 1327–1335. Westman, W. (1977), ''How Much are Nature's Services